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QUERY CONTROL FORM				RTIS USE ONLY	
Application No.	09/507,629	Prepared by	NPB	Tracking Number	05896024
Examiner-GAU	OLSEN-1763	Date	3/11/04	Week Date	1/26/04
		No. of queries	1	IFW	

JACKET			
a. Serial No.	f. Foreign Priority	k. Print Claim(s)	p. PTO-1449
b. Applicant(s)	g. Disclaimer	l. Print Fig.	q. PTOL-85b
c. Continuing Data	h. Microfiche Appendix	m. Searched Column	r. Abstract
d. PCT	i. Title	n. PTO-270/328	s. Sheets/Figs
e. Domestic Priority	j. Claims Allowed	o. PTO-892	t. Other

SPECIFICATION

a. Page Missing
b. Text Continuity
c. Holes through Data
d. Other Missing Text
e. Illegible Text
f. Duplicate Text
g. Brief Description
h. Sequence Listing
i. Appendix
j. Amendments
k. Other

CLAIMS

a. Claim(s) Missing
b. Improper Dependency
c. Duplicate Numbers
d. Incorrect Numbering
e. Index Disagrees
f. Punctuation
g. Amendments
h. Bracketing
i. Missing Text
j. Duplicate Text
k. Other

MESSAGE

Please provide clear/legible copies of the following:

a) PTO-1449 forms (see attached)
b) Field of Search data (see attached)
c) Oath
d) Amendment dated 07/29/02 (see attached)

All illegible. Please advise.

Thank you

initials

RESPONSE

initials

FORM PTO-1449 | U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE

ATTORNEY DOCKET NO. 1945 P3 US A SILICON | SERIAL NO. N/A

APPLICANT: Shen et al

FILING DATE: Herewith | GROUP: Unknown

LIST OF ART CITED BY APPLICANT

(Use several sheets if necessary)

U.S. PATENT DOCUMENTS

Examiner Initial		Document Number							Date	Name	Class	Subclass	Filing Date if Appropriate
	A1	4	2	8	[illegible]	2	[illegible]	7	08/04/83	Kavet	427	38	
	A2	4	4	3	[illegible]	2	[illegible]	[illegible]	02/21/84	Nishimatsu et al	[illegible]	[illegible] R	
	A3	4	4	6	[illegible]	5		[illegible]	08/14/84	Fukano	156	643	
	A4	4	4	9	[illegible]	2	[illegible]	[illegible]	12/25/84	Hartman	156	643	
	A5	4	5	0	[illegible]	[illegible]	1	4	[illegible]	Trumpp et al	156	643	
	A6	4	5	7	6	6	[illegible]	2	[illegible]/18/86	Tokuta et al	204	165	
	A7	4	7	0	[illegible]	5	[illegible]	[illegible]	11/10/87	Okudaira et al	156	643	
	A8	4	7	3	5	7	[illegible]	[illegible]	02/10/88	[illegible]	[illegible]	[illegible]	
	A9	4	7	8	6	[illegible]	[illegible]	[illegible]	11/21/88	Benzing	156	345	
	A10	4	8	3	5	3	[illegible]	[illegible]	[illegible]	Lin et al	156	345	
	A11	4	8	3	[illegible]	[illegible]	6	[illegible]	[illegible]	Saito et al	118	723	
	A12	4	8	6	[illegible]	5	6	1	[illegible]	Freeman et al	156	646	
	A13	4	8	6	7	8	4	1	[illegible]/10/89	Loewenstein et al	156	643	
	A14	4	8	7	[illegible]	2	[illegible]	2	10/24/89	[illegible]	437	31	
	A15	4	9	7	[illegible]	[illegible]	4	4	12/[illegible]/90	Yamazaki et al	156	643	
	A17	4	9	9	[illegible]	4		[illegible]	[illegible]	[illegible] et al	437	192	
	A18	5	[illegible]	[illegible]	[illegible]	6		2	[illegible]/26/91	Loewenstein et al	156	643	
	A19	5	0	1	[illegible]	3	[illegible]	8	[illegible]/07/91	Long et al	156	643	
	A20	5	0	3	[illegible]	7	[illegible]	8	[illegible]	M[illegible] et al	156	626	
	A21	5	0	8	[illegible]	1	[illegible]	6	[illegible]/28/92	McKee	156	345	
	A22	5	0	9	4	7		2	[illegible]/92	Becker et al	156	643	
	A23	5	1	1	0	4	[illegible]	8	[illegible]/92	[illegible] et al	156	643	
	A24	[illegible]	1	[illegible]	[illegible]	4		1	[illegible]	[illegible]	[illegible]	[illegible]	
	A25	[illegible]	1	1	8	3	[illegible]	7	[illegible]/92	Kadomura	156	[illegible]	
	A26	[illegible]	1	5	8	6	4	4	10/27/92	Cheung et al	156	643	
	A27	[illegible]	1	6	9	4	[illegible]	7	[illegible]/92	Latchford et al	156	656	
	A28	5	1	6	4	3	[illegible]	0	[illegible]/92	Davis et al	437	192	
	A29	[illegible]	1	7	6	7	0	2	[illegible]/93	[illegible] et al	156	[illegible]	
	A30	5	1	8	8	[illegible]	8	0	02/23/93	Lai	437	[illegible]	

EXAMINER: [illegible] reference considered, whether or not citation is in conformance with MPEP [illegible]. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

1C530 U.S. PTO 09/507629 02/18/00

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FORM PTO-1449	U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE	ATTORNEY DOCKET NO. 1945 P3 USA SILICON	SERIAL NO. N/A
LIST OF ART CITED BY APPLICANT (Use several sheets if necessary)		APPLICANT: Shen, et al	
		FILING DATE: Herewith	GROUP: Unknown

U.S. PATENT DOCUMENTS

Examiner Initial		Docket Number							Date	Name	Class	Subclass	Filing Date If Appropriate
[illegible]	A31	[illegible]		[illegible]	2	7	[illegible]	[illegible]	[illegible]	Tseng	437	47	
[illegible]	A32		[illegible]	[illegible]	[illegible]	[illegible]	3	[illegible]	[illegible]	Chang	134	1	
[illegible]	A33		2	8	6	2	4	[illegible]	[illegible]	Keller et al	156	643	
[illegible]	A34	[illegible]	2	8	1	[illegible]	6	[illegible]	[illegible]	Gabric et al	156	643	
[illegible]	A35		[illegible]	8	2	8	9	[illegible]	[illegible]	Balmashnov et al	118	723 R	
[illegible]	A36	[illegible]			2	[illegible]	1	[illegible]	[illegible]	Sakai et al	134	1	
[illegible]	A37	[illegible]			8	[illegible]	[illegible]	[illegible]	[illegible]	Tanaka et al	[illegible]	662	
[illegible]	A38	[illegible]	[illegible]		8		[illegible]	[illegible]	[illegible]	Szwejkowski et al	[illegible]	65[illegible]	
[illegible]	A39			[illegible]	[illegible]	4	[illegible]	[illegible]	[illegible]	Cheung et al	[illegible]	643	
[illegible]	A40	[illegible]	[illegible]	[illegible]	6	4	7	8	[illegible]	Chen et al	134	1	
[illegible]	A41	[illegible]	[illegible]	[illegible]	8	6	[illegible]	[illegible]	[illegible]	Cathey	156	656	
[illegible]	A42		[illegible]	[illegible]	8	[illegible]	1		[illegible]	Nagayama et al	156	64[illegible]	
[illegible]	A43		[illegible]	5	2	[illegible]	1	6	[illegible]	Hills et al	156	64[illegible]	
[illegible]	A44	[illegible]	[illegible]	5	9	1	[illegible]	[illegible]	[illegible]	Ehrmann	156	64[illegible]	
[illegible]	A45		[illegible]		3	[illegible]	[illegible]	[illegible]	[illegible]	Wadl et al	[illegible]	81	
[illegible]	A46		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible] et al	[illegible]	[illegible]	
[illegible]	A47		[illegible]	[illegible]	3	[illegible]	[illegible]	[illegible]	[illegible]	Jones et al	2[illegible]	47	
[illegible]	A48	[illegible]	[illegible]	4	[illegible]	[illegible]			[illegible]	Takada et al	118	723 MP	
[illegible]	A49	[illegible]	[illegible]	[illegible]	4	6	2	[illegible]	[illegible]	Burnstein et al	437	189	
[illegible]	A50	[illegible]	[illegible]	2	1	1	[illegible]	[illegible]	[illegible]	Chen et al	437	187	
[illegible]	A51		[illegible]	2	[illegible]	1	[illegible]	[illegible]	[illegible]	Grewal	216	68	
[illegible]	A52	[illegible]	6	2	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	Keller	438	72[illegible]	
[illegible]	A53	[illegible]	6	[illegible]	6	[illegible]	[illegible]	[illegible]	[illegible]	Roberts et al	216	67	
[illegible]	A54	[illegible]	6		[illegible]	[illegible]			[illegible]	[illegible] et al	2[illegible]	[illegible]	
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[illegible]	A56	[illegible]	7	[illegible]	3	[illegible]	[illegible]	3	[illegible]	Saito	437	192	
[illegible]	A57	[illegible]	[illegible]	[illegible]	6	1	[illegible]	[illegible]	[illegible]	Ye et al	438	710	
[illegible]	A58	[illegible]	[illegible]	6	[illegible]		2	[illegible]	[illegible]	Imai et al	438	710	
[illegible]	A59		[illegible]	8	8	[illegible]	[illegible]	8	[illegible]	Shang et al	134	1	
[illegible]	A60		[illegible]	8	8	[illegible]	[illegible]	[illegible]	[illegible]	Steger et al	156	345	

EXAMINER [signature] DATE CONSIDERED [illegible]

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FORM PTO-1449 U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE	ATTORNEY DOCKET NO. 1965.PS.USA.SILICON	SERIAL NO. N/A
LIST OF ART CITED BY APPLICANT (Use several sheets if necessary)	APPLICANT: Shen et al.	
	FILING DATE: Herewith	GROUP: Unknown

U.S. PATENT DOCUMENTS

EXAMINER Initial		DOCUMENT NUMBER							DATE	NAME	CLASS	SUBCLASS	FILING DATE IF APPROPRIATE
	A61	5	8	1	3	0	2	2	09/02/98	Sayas et al.	216	95	
	A62	5	8	3	2	5		4	10/06/98	Ye et al.	438	30	
	A63	5	8	4	3	2	5	9	12/01/98	Shrotriya	134	1.1	
	A64	5	8	4	9	0	9	2	12/15/98	Ni et al.	134	1.1	
	A65	5	8	6	6	4	8	3	02/02/99	Shum et al.	438	22	
	A66	5	8	6	9	4	0	1	02/09/99	Bruennemer et al.	438	710	
	A67	5	8	7	4	3	6	3	02/23/99	Hoh et al.	438	723	
	A68	5	8	7	9	5	7	3	03/09/99	Tepman et al.	216	68	
	A69												
	A70												
	A71												
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SHEET 4 OF

FORM PTO-1449 — U.S. DEPARTMENT OF COMMERCE — PATENT AND TRADEMARK OFFICE

LIST OF ART CITED BY APPLICANT

ATTORNEY DOCKET NO. 1545.P3 USA SILICON	SERIAL NO. N/A
APPLICANT: Shah et al.	
FILING DATE: Herewith	GROUP: Unknown

FOREIGN PATENT DOCUMENTS

		DOCUMENT NUMBER	DATE	COUNTRY	CLASS	SUBCLASS	TRANSLATION YES	TRANSLATION NO
	B1	0 5 7 2 1 4 3	06/22/88	EP Application				
	B2	0 3 1 4 9 9 1	08/30/89	EP Application				
	B3	0 4 0 5 3 7 2	01/02/92	EP Application				
	B4	0 5 1 0 0 4 3	12/02/92	EP Application				
	B5	0 5 5 5 5 4 0	08/18/93	EP Application				
	B6	0 6 0 7 3 0 7	02/23/94	EP Application				
	B7	0 7 4 0 0 3 5	12/04/96	EP Application				
	B8	0 7 0 0 7 3 5	02/05/97	EP Application				
	B9	3 1 3 2 8 5 0	04/08/93	German Application			✓	
	B10	0 1 7 7 0 0 2	06/24/94	Japan			✓	
	B11	7 0 2 0 8 7 0	01/31/95	Japan			✓	
	B12	0 0 1 5 5 4 3	08/23/00	PCT				
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	B28							
	B29							

EXAMINER: Alan Chen — DATE CONSIDERED: 2/6/02

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FORM PTO-1449 U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE	ATTORNEY DOCKET NO. 1945 P3 USA SE ICON	SERIAL NO. N/A
LIST OF ART CITED BY APPLICANT (Use several sheets if necessary)	APPLICANT: Shen et al.	
	FILING DATE: Herewith	GROUP: Unknown

OTHER ART (Including Author, Title, Date, Pertinent Pages, etc.)

	C1	Avdil et al. "Multiple Steady States in a Radio Frequency Chlorine Glow Discharge" J. Appl. Phys. Volume/or No. 1 January 1 1994 Pages 109-114
	C2	Hellums N.J. et al. "A Symmetric Subvolt CMOS Technology" IEEE Pages 232-237 1990
	C3	PCT Notification of International Search Report dated October 28 1999
	C4	PCT Notification of International Search Report dated February 1 2000
	C5	
	C6	
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SHEET 1 OF 1

PENDING U.S. PATENT APPLICATIONS

ATTORNEY DOCKET NO.: 1945.P3/USA/SILICON
SERIAL NUMBER: N/A
FILING DATE: HEREWITH
INVENTORS: SHEN, ET AL

EXAMINER INITIAL		PENDING U.S. PATENT APPLICATIONS
Acw	D1	U.S. Patent Application entitled, "Method for Improved Cleaning of Substrate Processing System"; filed July 11, 1997; Serial No. 08/893,922; Inventors: Kao, et al.
	D2	U.S. Patent Application entitled, "Apparatus for Improved Remote Microwave Plasma source for Use with Substrate Processing Systems"; filed April 23, 1997; Serial No. 08/839,111; Inventors: Kao, et al.
	D3	U.S. Patent Application entitled, "Method and Apparatus for Determining the Endpoint in a Plasma Cleaning Process"; filed July 2, 1997; Serial No. 08/887,165; Inventors: Subrahmanyam, et al.
	D4	U.S. Patent Application entitled, "Apparatus and Method for Efficient and Compact Remote Microwave Plasma Generation"; filed April 22, 1997; Serial No. 08/839,007; Inventor: Bhatnagar
	D5	U.S. Patent Application entitled, "Method and Apparatus for Pre-stabilized Plasma Generation for Microwave Clean Applications"; filed November 13, 1996; Serial No 08/746,658; Inventors: Fong, et al.
	D6	U.S. Patent Application entitled, "Inductively Coupled HDP-CVD Reactor"; filed May 29, [illegible] Redeker, et al.
	D7	U.S. Patent Application entitled, "Symmetric Tunable Inductively Coupled HDP-CVD Reactor"; filed July 15, 1996; Serial No. 08/679,927, Inventors: Redeker, et al.
	D8	U.S. Patent Application entitled, "Apparatus and Methods for Upgraded Substrate Processing System with Microwave Plasma Source"; filed March 5, 1997; Serial No. 08/811,627; Inventors: Tanaka, et al.
Acw	D9	U.S. Patent Application entitled, "Microwave Apparatus for In-situ Vacuum Line Cleaning for Substrate Processing Equipment"; filed October 30, 1996; Serial No. 08/741,241; Inventors: Pang, et al.
	D10	
	D11	
	D12	
	D13	
	D14	

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ATTORNEY DOCKET NO. (with PCT SERIES ONLY IF KNOWN)

SERIAL NO. (group/art unit)

APPLICANT(S) (IF KNOWN)

GROUP 1746

FILING DATE (if known)

U.S. PATENT DOCUMENTS

Examiner Initial		Document Number	Date	Name	Class	Subclass	Filing Date if Appropriate
	AA	4 - 5 8 - 4 9 4	4/30/85	DUCKERY	US	75	
	AB	4 -					
	AC						
	AD						
	AE						
	AF						
	AG						
	AH						
	AI						
	AJ						
	AK						

FOREIGN PATENT DOCUMENTS

		Document Number	Date	Country	Class	Subclass	Translation Yes	Translation No
	AL							
	AM							
	AN							
	AO							
	AP							

OTHER ART (Including Author, Title, Date, Pertinent Pages, etc.)

	AQ	
	AR	
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	AW	
	AX	

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ATTORNEY DOCKET NO. 1615.P.US.V — SERIAL NO. 10/[illegible]

APPLICANT: Shi et al.

FILING DATE: 02 18 2004 — GROUP: 1774

LIST OF ART CITED BY APPLICANT

(Use several sheets if necessary)

U.S. PATENT DOCUMENTS

Examiner Initial		Document Number	Date	Name	Class	Subclass	Filing Date If Appropriate
[illegible]	AA	[illegible]	[illegible]	Lee	428	713	
[illegible]	AB	[illegible]	[illegible]	Haimer et al.	[illegible]	719	
	AC					TECHNICAL	
	AD						
	AE						
	AF					977	700
	AG						
	AH						
	AI						

FOREIGN PATENT DOCUMENTS

		Document Number	Date	Country	Class	Subclass	Translation YES	Translation NO
[illegible]	AJ	[illegible]	[illegible]	Japan			NO ABSTRACT ONLY	
[illegible]	AK	[illegible]	[illegible]	Taiwan				X
[illegible]	AL	[illegible]	[illegible]	EP			X	
	AM							
	AN							

OTHER ART (Including Author, Title, Date, Pertinent Pages, etc.)

[illegible]	AO	PCT Search Report dated [illegible] 8 04
	AP	
	AQ	

EXAMINER: [illegible] — DATE CONSIDERED: 2/1/05

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LIST OF ART CITED BY APPLICANT

ATTORNEY DOCKET NO. [illegible] — SERIAL NO. [illegible]

APPLICANT: Shen et al

FILING DATE: 2/15/2 — GROUP: [illegible]

U.S. PATENT DOCUMENTS

Examiner Initial		DOCUMENT NUMBER	DATE	NAME	CLASS	SUBCLASS	FILING DATE IF APPROPRIATE
[illegible]	AA	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
[illegible]	AB	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
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	AH						
	AI						

FOREIGN PATENT DOCUMENTS

		DOCUMENT NUMBER	DATE	COUNTRY	CLASS	SUBCLASS	TRANSLATION YES	TRANSLATION NO
[illegible]	AJ	[illegible]	[illegible]	EP				
[illegible]	AK	[illegible]	[illegible]	EP				
	AL							
	AM							
	AN							

OTHER ART (Including Author, Title, Date, Pertinent Pages, etc.)

[illegible]	AO	PCT Report dated the 22 01, European Patent Office, P.B. 5818 Patentlaan 2 NL-2280 HV Rijswijk
[illegible]	AP	Zafes L. et al "Tungsten Silicide Polysilicon Stack Etching using Mixed Fluorine Chlorine Chemistry in a High Density Plasma Chamber", Electrochemical Society Proceedings Volume 98-1 pages 263-269
[illegible]	AQ	[illegible]

EXAMINER: [illegible] — DATE CONSIDERED: 7/16/02

EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant

FORM PTO-1449 U.S. DEPARTMENT OF COMMERCE
PATENT AND TRADEMARK OFFICE

INFORMATION DISCLOSURE STATEMENT
IN AN APPLICATION

DOCKET NO.

APPLICATION NO.

APPLICANT

GROUP ART UNIT

FILING DATE

U.S. PATENT DOCUMENTS

EXAMINER INITIAL	DOCUMENT NUMBER	DATE	NAME	CLASS	SUBCLASS	FILING DATE IF APPROPRIATE

RECEIVED
FEB - 4 2002
TC 1700

FOREIGN PATENT DOCUMENTS

EXAMINER INITIAL	DOCUMENT NUMBER	DATE	COUNTRY	CLASS	SUBCLASS	TRANSLATION

OTHER DOCUMENTS (*Including Author, Title, Date, Pertinent Pages, etc.*)

EXAMINER

DATE CONSIDERED 3/7/02

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SHEET 1 OF 1

FORM PTO-1449 U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE	INFORMATION DISCLOSURE STATEMENT BY APPLICANT	APPLICATION NO.
		GROUP ART UNIT: 1762

U.S. PATENT DOCUMENTS

EXAMINER INITIAL	DOCUMENT NUMBER	DATE	NAME	CLASS	SUBCLASS	FILING DATE IF APPROPRIATE
[illegible]	[illegible]	[illegible]	[illegible]	204	192.37	
[illegible]	[illegible]	2/25/1997	Kawasaki et al	435	6.95	
[illegible]	[illegible]	[illegible]	[illegible]	134	CC1	

FOREIGN PATENT DOCUMENTS

EXAMINER INITIAL	DOCUMENT NUMBER	DATE	COUNTRY	CLASS	SUBCLASS	TRANSLATION

OTHER DOCUMENTS (*Including Author, Title, Date, Pertinent Pages, etc.*)

EXAMINER INITIAL	
	[illegible] Pages of Publication [illegible]

EXAMINER: [signature] DATE CONSIDERED: 11/26/02

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U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE		
INFORMATION DISCLOSURE STATEMENT IN AN APPLICATION		

U.S. PATENT DOCUMENTS

EXAMINER INITIAL	DOCUMENT NUMBER	DATE	NAME	CLASS	SUBCLASS	FILING DATE IF APPROPRIATE

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FOREIGN PATENT DOCUMENTS

DOCUMENT NUMBER			CLASS	SUBCLASS	TRANSLATION	

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FORM PTO-1449 (MODIFIED) — U.S. DEPARTMENT OF COMMERCE — PATENT AND TRADEMARK OFFICE

INFORMATION DISCLOSURE STATEMENT IN AN APPLICATION

(Use several sheets if necessary)

DOCKET	APPLICATION NO.
0103045 USA/P03 ETCH SERIES 3B	[illegible]
APPLICANT: SHEN et al.	
FILING DATE: 02/18/2003	GROUP ART UNIT: 1763

U.S. PATENT DOCUMENTS

EXAMINER INITIAL	DOCUMENT NUMBER	DATE	NAME	CLASS	SUBCLASS	FILING DATE IF APPROPRIATE
[illegible]	6,299,923	11/6/2001	HORI et al.			
[illegible]	6,383,[illegible]	1/24/2002	MAK et al.			
[illegible]	6,180,404	1/30/2001	TAESLER et al.			
[illegible]	6,221,654	8/7/2001	KUMAR et al.			
[illegible]	6,425,886	7/30/2002	KAO et al.			
[illegible]	6,461,233	10/8/2002	SUKIN et al.			

FOREIGN PATENT DOCUMENTS

	DOCUMENT NUMBER	DATE	COUNTRY	CLASS	SUBCLASS	ABSTRACT YES	ABSTRACT NO

OTHER DOCUMENTS (*Including Author, Title, Date, Pertinent Pages, etc.*)

[illegible]	Kimuzuka, Masakatsu et al. "Pattern Profile Control in Magnetron reactive ion etching of Poly-Si." J. Vac. Sci. Technol. B 10(5), Sept/Oct 1992, pp. 2192-2196

EXAMINER: [illegible] DATE CONSIDERED: 5/24/03

EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

SEARCHED

SEARCH NOTES
(INCLUDING SEARCH STRATEGY)

updated 5/03 AM

INTERFERENCE SEARCHED

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of: Olsen et al.	Group Art Unit: 1746
Serial No: 09/507,629	Examiner: Allan W. Olsen
Filed: February 18, 2000	Attorney Docket No: 001945 USA P03/SILICON/JB
Title: SELF-CLEANING PROCESS FOR ETCHING SILICON-CONTAINING MATERIAL	July 23, 2002 San Francisco, California

AMENDMENT

Box Fee Amendment
Commissioner for Patents
Washington, D.C. 20231

Examiner Olsen

March 29, 2002, and is being filed within four months thereof with a request for one month extension of time.

IN THE SPECIFICATION

Please substitute the following amended paragraphs for the corresponding original paragraphs. A marked copy of the paragraph amendments is attached hereto.

On page 8, second full paragraph

An energized gas or plasma is generated from the process gas by a gas energizer 46 that couples electromagnetic energy, such as RF or microwave energy, to the process gas in the process zone 30 of the chamber 28, such as for example, an inductor antenna 48 comprising one or more coils powered by an antenna power supply 50 that inductively couples RF energy to process gas in the chamber 28. In addition or as an alternative chamber design, a first process electrode 51 such as an electrically grounded sidewall or ceiling of the chamber 28 and a second electrode 52 such as an electrically conducting portion of the support 32 below the substrate 24 may be used to further energize the gas in the chamber 28. The first and second electrodes 51, 52 are electrically biased relative to one another by an RF voltage provided by an electrode voltage supply 54. The frequency of the RF voltage applied to the inductor antenna 48 and or to the electrodes 51, 52 is typically from about 50 kHz to about 60 MHz.

In the paragraph bridging pages 8 and 9

The chamber 28 further comprises a process monitoring system 56 to monitor the process being performed on the substrate 24. The process monitoring system 56 may monitor, for example, an emission from a plasma generated inside the chamber 28, the plasma emission being generally multispectral, i.e., providing radiation having multiple wavelengths extending across a spectrum. In addition, quartz crystal microbalance (QCM) during the etching process. Generally, the microbalance 58 is a piezoelectric plate that

changes capacitance when etchant residue is deposited on the plate. The microbalance 58 is mounted on an internal surface in the chamber 28, such as a chamber sidewall, and connected to a QCM computer 60 outside the chamber 28.

In the paragraph bridging pages 11 and 12,

The process sequencer program 134 comprises program code to accept the chamber type and set of process parameters from the process selector program 132 and to control operation of the chamber 28. The sequencer program 134 initiates execution of the process set by passing the particular process parameters to a chamber manager program 136 that controls multiple processing tasks in a chamber 28 and typically includes a process chamber program 124 and a process monitoring program 126. The process chamber program 124 includes program code to set the timing, gas composition, gas flow rates, chamber pressure, chamber temperature, RF power levels, support position, heater [illegible] and other parameters of a particular process. Typically, the process chamber program 124 includes a substrate positioning program 138, a gas flow control program 140, a gas pressure control program 142, a gas energizer control program 144, and a substrate temperature control program 146. Typically, the substrate positioning program 138 comprises program code for controlling chamber components that are used to load the substrate 24 onto the support 32 and optionally, to lift the substrate 24 to a desired height in the chamber 28 to control the spacing between the substrate 24 and the gas outlets 38 of the gas delivery system 34. The gas flow control program 140 has program code for controlling the flow rates of different constituents of the process gas. The gas flow control program 140 may also control the open close position of the safety shut-off valves, and ramp up/down the gas flow controller 40 to obtain the desired gas flow rate. For example, the gas flow control program 140 may be used to set the flow rates of the different gases or to exclude particular gases from the gas composition. The pressure control program 142 [illegible] aperture size of the throttle valve 44 in the exhaust system 42. The gas energizer control

program 144 comprises program code for setting low and high-frequency RF power levels applied to the process electrodes 51, 52. Optionally, the substrate temperature control program 146 comprises program code for controlling the temperature of a heater element (not shown) used to heat the support 32 and substrate 24, or the flow rate and temperature of fluid circulated through the support 32.

On page 12, first full paragraph:

The process monitoring program 126 comprises program code that obtains sample or reference signals from the chamber 28 and processes the signal according to preprogrammed criteria. The program 126 may also send instructions to the chamber manager program 136 or other programs to change the process conditions or other chamber settings. For example, the process monitoring program 126 may comprise program code to analyze an incoming signal trace provided by the process monitoring [illegible] desired set of criteria is reached, such as when an attribute of the detected signal is substantially similar to a pre-programmed value. The process monitoring program 126 may also be used to detect a property of a material being processed on the substrate 24, such as a thickness or other properties, for example, the crystalline nature, microstructure, porosity, electrical, chemical and compositional characteristics of the material on the substrate 24. Upon detecting an onset or completion of a process, the process monitoring program signals the process chamber program 126 which sends instructions to the controller 106 to change a process condition in a chamber 28 in which the substrate 24 is being processed. The controller 100 is adapted to control one or more of the gas delivery system 34, plasma generator 46, or throttle valve 44 to change a process condition in the chamber 28 in relation to the received signal.

In the paragraph bridging pages 12 and 13

Referring to Figure 1, the data signals received by and/or evaluated by the controller 100 may also be sent to a factory automation host computer 300. The factory automation host computer 300 may comprise a host software program 302 that evaluates data from several platforms or chambers 28, and for batches of substrates 24 or over an extended period of time, to identify statistical process control parameters of (i) the processes conducted on the substrates 24, (ii) a property that may vary in a statistical relationship across a single substrate 24, or (iii) a property that may vary in a statistical relationship across a batch of substrates 24. The host software program 302 may also use the data for ongoing in-situ process evaluations or for the control of other process parameters. A suitable host software program comprises a WORKSTREAM™ software program available from aforementioned Applied Materials. The factory automation host computer 300 may be further adapted to provide instruction signals to (i) remove particular substrates 24 from the processing sequence, for example, if a substrate property is inadequate or does not fall within a statistically determined range of values, or if a process parameter deviates from an acceptable range, (ii) end processing in a particular chamber 28, or (iii) adjust process conditions upon a determination of an unsuitable property of the substrate 24 or process parameter. The factory automation host computer 300 may also provide the instruction signal at the beginning or end of processing of the substrate 24 in response to evaluation of the data by the host software program 302.

In the paragraph bridging pages 15 and 16

Table III shows the polysilicon etch rate and the etch rate uniformity for examples 5 to 17 for etching blanket undoped polysilicon on a silicon substrate in a DPS chamber. The process variables included gas pressure (4, 12 or 20 mTorr), source power

flow rate of 10, 20, 40 or 100 sccm. It is seen that the optimal etch rate and uniformity was at about 10:1 to 3:1 volumetric flow ratio of CF_4 to chlorine

In the paragraph bridging pages 16 and 17

As shown in Figure 4, the addition of a Cl_2 to a CF_4 based gas chemistry that is absent HBr had a significant effect on the polysilicon etch rate and uniformity. The bars represent the etch rate uniformity and the line represents the etch rate. This figure plots the results of examples 12 to 15, in which the source power was held at 600 watts, the bias power at 100 watts, and the helium backside gas pressure maintained at 12 Torr. Adding 20 sccm of Cl_2 (in 100 sccm of CF_4) increased the polysilicon etch rate nearly 70%, and improved uniformity from greater than 5 (1σ) to less than 2 (1σ). However, further increasing the Cl_2 flow to 40 sccm did not change the etch rate but degraded etch rate uniformity back to about 5 to 6. These results indicate that a balanced CF_4 to Cl_2 ratio [illegible] the optimal gas ratio also depends on the gas composition. Good etch rate uniformity can be obtained with CF_4/Cl gas ratio ranging from 1:1 to 5:1 at 4mTorr, while the gas ratio was limited to around 5:1 at a higher pressure of 12mTorr. At higher gas pressure, source power became a dominating factor in uniformity control, with improved uniformity at a high source power.

On page 18, Table V

Table V

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]